REMARKS

Reconsideration of this application is requested. Claims 1-6 will be active in the application subsequent to entry of this amendment.

Attached to this response is a Declaration of the inventor, Mr. Tamura, made March 14, 2003. The outstanding Official Action, paper No. 13, makes no mention of this Declaration although a photocopy was submitted with the amendment and response filed March 18, 2003. The attached is to assure that this evidence is part of the record and is considered during further examination of this application.

New claim 6 is presented directed to preferred aspects of the invention and places emphasis on the surface layer portion of the heat-resistant glass fiber specifying the minimum thickness as given in original claim 2 and the fact that the surface layer is rich in SiO_2. The significance of this claim will be discussed below.

The current Official Action is the third examination on the merits. Based on the comments in the current Action, it is counsel's understanding the previous rejection based on Eastes et al U.S. '329 and JP-A-5-147975 has been overcome. In the current Official Action, the Examiner argues that claims 1-3 are obvious over Eastes et al U.S. '329 in view of Sproull U.S. '106 (newly cited) and that claims 4-5 are obvious over Eastes et al U.S. '329 in view of Sproull U.S. '106 further in view of JP-A-5-147975.

Applicant disagrees with these rejections and explain his position below.

Applicant's Contribution to the Art

The present invention relates to a heat-resistant glass fiber suitable for use in an automobile muffler, and the like (Specification, [0001]).

For obtaining this heat-resistant glass fiber, the present invention selects a glass having a composition composed of 56 to 58.5 wt % of SiO_2, 12 to 17 wt% of Al_2O_3, 16 to 27% of CaO, 1 to 9 wt % of MgO, 0 to 1 wt% of Na_2O and 0 to 1% of K_2O, as described in claim 1, as a glass composition that is easily treated with an acid. This glass that is easily treated with an acid is surface-treated with an acid, to obtain the heat-resistant-

glass fiber that has a surface layer having an SiO_2 content of at least 90% and has excellent heat resistance.

That is, in the present invention, the requirement of the components of the glass composition and the requirement of the surface layer having an SiO_2 content of at least 90 wt% are closely related to each other. According to the present invention, only when these features are present can the glass fibers excellent in heat resistance be obtained.

Synopsis of the Applied References.

Eastes et al U.S. '329

In contrast to the present invention, Eastes et al U.S. '329 merely discloses a glass fiber useful as reinforcement and textile glass fibers (col. 1, lines 13-16)--improved heat resistance is not an objective of the Eastes disclosure.

Further, since Eastes et al U.S. '329 has no objective to improve the glass fiber in heat resistance, it does not disclose that a surface layer of the glass fiber is enriched with SiO_2--in fact there is no indication Eastes' fiber has a surface any different from the core of the fiber.

The glass composition of the glass fiber disclosed in Eastes et al U.S. '329 has an SiO_2 content of 59.0 to 61.0 wt%. Applicant has found the glass fiber having such a high SiO_2 content is difficult to treat with an acid, and even if an acid treatment is carried out, a surface layer having an SiO_2 content of at least 90 wt% cannot be formed. This point is already stated in the response of March 18, 2003 and demonstrated by the evidence contained in the Declaration prepared by the present inventor (see Declaration, page 5, Table 2, Comparative Example 3 and page 6, lines 6-9). So even if the Eastes glass fiber (having a greater SiO_2 content) is subjected to acid treatment a discrete surface layer rich in SiO_2 does not result.

Nowhere in the discussion contained in the Official Action is there mention made of the evidence provided in Mr. Tamura's Declaration. This evidence directly addresses the primary reference and explains why the glass composition described in it is not only different but provides an unacceptable product.

Counsel observes that the requirements for reviewing such evidence are quite clear *see* M.P.E.P. 716.01, page 700-146, center of the right hand column which states:

> "Where the evidence is insufficient to overcome the rejection, the examiner must specifically explain why the evidence is insufficient. General statements such as 'the declaration lacks technical validity' or 'the evidence is not commensurate with the scope of the claims' without an explanation supporting such findings are insufficient."

The current Official Action does not comment on that which declarant shows based upon the evidence in his declaration. Accordingly, applicant believes he has not had a full and complete examination of his claims having regard to all the information contained in the record of this application as it stood as of April 10, 2003, the mailing date of paper No. 13. For this reason, should the next communication be other than a Notice of Allowance or letter of allowability, the next communication should not be made final in nature as the previous examination is, according to the requirements of the M.P.E.P., "insufficient" for the reasons noted above.

Sproull U.S. '106

Sproull U.S. '106 newly cited in the outstanding Official Action describes a glass fiber having an SiO_2 content of 58 to 60%. This SiO_2 content is smaller than the SiO_2 content in the glass fiber disclosed in Eastes et al U.S. '329 and overlaps with the SiO_2 content of 56 to 58.5% in the glass fiber specified in the present claim 1. The Official Action omits mention of a critical requirement of this reference. The glass fiber described in Sproull U.S. '106 contains, as an essential component, 1 to 5% of TiO_2 (see Abstract)--a significant amount--that is not an essential component for the glass fiber specified in the present claim 1.

According to Sproull, TiO_2 increases the liquidus temperature of a glass when a glass fiber is formed so that it is necessary to form the glass fiber at a high temperature. When the thus-formed glass fiber is treated with an acid like the present invention in

order to remove components soluble in the acid, TiO_2 is not a desirable component since TiO_2 is not easily soluble in the acid.

The glass fiber described in Sproull U.S. '106 has an SiO_2 content of 58 to 60%, which content is generally higher as compared with the SiO_2 content of 56 to 58.5% specified in the present claim 1, so the glass fiber in Sproull U.S. '106 is liable to be difficult to treat with an acid.

Sproull's glass fiber also contains TiO_2 as an essential component, which means it is more difficult to treat the glass fiber with an acid. Therefore, the glass fiber described in Sproull U.S. '106 would not provide a glass fiber rich with SiO_2 in its surface layer.

JP-A-5-147975

Applicant already discusses this document in his specification. ("JPA" hereinafter) [0003]. The heat-resistant glass fiber described in JPA is obtained by treating E glass with an acid and has a surface layer having an SiO_2 content of 80 wt% or more.

However, the heat resistance of the glass fiber described in JPA is unacceptable for use in a muffler where the exhaust gas has a temperature of 850°C or higher, as discussed in [0004] of the present specification.

The glass fiber described in JPA is formed of E glass except for its surface layer and therefore contains a large amount of B_2O_3 that is not an essential component for the glass fiber recited in the present claim 1.

Claims 1-3 are patentable over Eastes et al U.S. '329 in view of Sproull U.S. '106

The glass fiber specified in the present claim 1 has excellent heat resistance that is imparted by carefully selecting a glass fiber that is easily treated with an acid and when treated with an acid the glass fiber forms a surface layer having an SiO_2 content of at least 90%.

In contrast, the glass fiber described in Eastes et al U.S. '329 has a large SiO_2 content and is therefore difficult to treat with an acid as demonstrated and confirmed by the Declaration of record.

Further, the glass fiber described in Sproull U.S. '106 contains TiO_2 as an essential component making it difficult to treat with an acid.

The glass fibers described in these two references have glass compositions that are difficult to treat with an acid. Even if attempts are made to treat these glass fibers with an acid, one will not obtain a heat-resistant glass fiber with a surface layer having an SiO_2 content of 90% or more. Therefore, claim 1 and claims 2 and 3 dependent upon claim 1, are unobvious over the above two references.

Claims 4 and 5 are patentable over Eastes U.S. '329 in view of Sproull U.S. '106 further in view of JP-A-5-147975

The process for the production of a heat-resistant glass fiber, recited in claims 4 and 5, is characterized in that the surface of the glass fiber specified in claim 1 is treated with a mineral acid. However, as the glass fibers described in Eastes et al U.S. '329 and Sproull U.S. '106 are difficult to treat with an acid, even if the acid treatment described in JP-A-5-147979 is applied to these fibers, one will not obtain heat-resistant-glass fibers having an SiO_2-rich surface layer. Therefore, claim 4 and claim 5 dependent upon claim 4 are not obvious over Eastes et al U.S. '320 and Sproull U.S. '106 in view of JP-A-5-147975.

Having fully responded to all of the pending rejections contained in the Official Action, applicants submit that the claims are in condition for allowance and earnestly solicit an early notice to that effect. The examiner is invited to contact the undersigned if any further information is required.

Respectfully submitted,

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